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Abundance and Run Timing of Adult Pacific Salmon in the East Fork Andreafsky River, Yukon Delta National Wildlife Refuge, Alaska, 2006

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Raymond F. Hander

Abstract

A resistance board weir was used to collect abundance, run timing, and biological data from salmon returning to the East Fork Andreafsky River, a tributary to the lower Yukon River, between June 28 and July 27, 2006. In 2006, an estimated 6,463 Chinook salmon *Oncorhynchus tshawytscha* migrated through the weir. Three age groups were identified from 522 Chinook salmon sampled with age 1.3 (55%) dominating. The sex composition was 44% female. An estimated 102,260 chum salmon *O. keta* migrated through the weir. Four age groups were identified from 727 summer chum salmon sampled, with age 0.4 (72%) dominating. The sex composition was 48% female. An estimated 220,735 pink salmon *O. gorbuscha*, 426 sockeye salmon *O. nerka*, and 23 coho salmon *O. kisutch* migrated through the weir. Other species counted through the weir during 2006 included 5,829 whitefish (Coregoninae), four Arctic grayling *Thymallus arcticus*, 51 northern pike *Esox lucius*, and two Dolly Varden *Salvelinus malma*.

Introduction

The Andreafsky River is one of several lower Yukon River tributaries on the Yukon Delta National Wildlife Refuge (Refuge). The Andreafsky River and its primary tributary, the East Fork Andreafsky River, provide important spawning and rearing habitat for Chinook *Oncorhynchus tshawytscha*, chum *O. keta*, coho *O. kisutch*, pink *O. gorbuscha*, and sockeye *O. nerka* salmon (USFWS 1991). The Andreafsky River supports one of the largest returns of Chinook salmon, has the second largest return of summer chum salmon (Bergstrom et al. 1998), and is believed to have the largest return of pink salmon in the Yukon River drainage (USFWS 1991). These Andreafsky River salmon stocks contribute to a large subsistence fishery in the lower Yukon River.

The Alaska National Interest Lands Conservation Act (ANILCA) mandates that salmon populations and their habitats be conserved within National Wildlife Refuge lands, international treaty obligations be fulfilled, and subsistence opportunities for local residents be maintained (USFWS 1991). Compliance with ANILCA mandates cannot be ensured without reliable data on salmon stocks originating from within Refuge boundaries. It is the goal of the U.S. Fish and Wildlife Service (USFWS) to conserve fish and wildlife populations, maintain habitats in their natural diversity, and provide the opportunity for continued subsistence use by local residents.

In general, Chinook and chum salmon runs have exhibited steady improvements since 2001 with harvestable surpluses from 2002 – 2005 (JTC 2006). Poor salmon returns from 1998 – 2001 in the Yukon River resulted in harvest restrictions, complete fishery closures, and spawning escapements below management goals on many tributaries in the Yukon River drainage (Vania

Author: Raymond F. Hander is a fishery biologist with the U.S. Fish and Wildlife Service. He can be contacted at Fairbanks Fish and Wildlife Field Office, 101 12th Ave., Room 110, Fairbanks, Alaska 99701; or ray_hander@fws.gov.

et al. 2002; Kruse 1998). The need to collect accurate escapement estimates is required to maintain genetic diversity, determine exploitation rates, and spawner recruit relationships (Labelle 1994). Data on escapement counts, which are necessary for effective management, are lacking for many individual stocks in the Yukon River drainage. Individual salmon stocks that are returning in low numbers or having early and late run timing may be incidentally over-harvested. Federal and State fishery managers attempt to distribute salmon harvest over time to avoid over-harvesting an individual salmon stock (Mundy 1982).

In compliance with ANILCA mandates, the USFWS has operated a weir on the East Fork Andreafsky River since 1994. Specific objectives of the 2006 project are to: (1) enumerate adult salmon escapement; (2) describe run timing of Chinook and summer chum salmon returns; (3) estimate age, sex, and length composition of adult Chinook and summer chum salmon populations; and (4) identify and count other fish species passing through the weir.

Study Area

The Andreafsky River is located in the lower Yukon River drainage in western Alaska (Figure 1). The regional climate is subarctic with extreme temperatures reaching 28˚ C in summer and – 42˚C in winter at St. Mary's, Alaska (Leslie 1989). Mean July high and February low temperatures between 1976 and 2000 were 18˚ and – 22˚C, respectively. Average yearly precipitation is approximately 48 cm of rain and 172 cm of snow. The Andreafsky River ice breakup typically occurs in May or early June, and usually begins to freeze in late October (USFWS 1991). Maximum discharge is most often reached following breakup. Sporadic high discharge periods generated by heavy rains occur between late July and early September.

The Andreafsky River is one of the three largest Yukon River tributaries within the Refuge boundaries (USFWS 1991) and drains a watershed of approximately 5,450 km^2. The mainstem and the East Fork Andreafsky River parallel each other in a southwesterly direction for more than 200 river-kilometers (rkm) and converge 7 rkm above its confluence with the Yukon River. The mouth of the Andreafsky River is approximately 160 rkm upstream from the mouth of the Yukon River. The East Fork and main-stem Andreafsky River flow through the Andreafsky Wilderness and the portions of each river within Refuge boundaries are designated as Wild and Scenic Rivers.

The East Fork Andreafsky River originates in the Nulato Hills at approximately 700 m elevation and drains an area of about 1,950 km^2 (USFWS 1991). The river cuts through alpine tundra at an average gradient of 7.6 m per km for 48 rkm. It then flows for 130 rkm through a forested river valley bordered by hills that rarely exceed 400 m elevation. Willow, spruce, alder, and birch dominate the riparian zone and much of the hillsides. This section drops at an average rate of 1.4 m per km and is characterized by glides and riffles with a gravel and rubble substrate. The river widens in the lowermost 38 rkm and the gradient changes to 0.14 m per km. The valley here is a wetland, interspersed with forest and tundra, and bordered by hills that are typically less than 230 m elevation. Aquatic vegetation grows in the slower flowing stream channels. Water level fluctuations on the Yukon River also affect the stage height in the lower sections of the East Fork and main-stem Andreafsky River.

Methods

Weir Operation

A modified resistance board weir (Tobin 1994; Tobin and Harper 1995; Zabkar and Harper 2003) spanning 105 m was installed in the East Fork Andreafsky River (62° 07'N, 162° 48.4'W) approximately 43 rkm upstream from the Yukon-Andreafsky River confluence and 26 air-km northeast of St. Mary's, Alaska (Figure 1). The weir site is located approximately 2.4 rkm downstream from the 1994 weir site described by Tobin and Harper (1995) and 2.1 rkm downstream from the 1981-1988 sonar and counting tower site described by Sandone (1989). Weir panel picket spacing (4.8 cm) was designed to remain functional during higher water flow, but allowed some small pink salmon and resident fish to pass through the weir undetected. Beginning in 1995, weir operation was extended into September to collect coho salmon data. In 2006, available funding only allowed weir operation for targeted collection of Chinook and summer chum salmon data.

A staff gauge was installed upstream of the weir to measure daily water levels. Staff gauge measurements were calibrated to correspond with the average water depth across the river channel at the upstream edge of the weir. Water temperatures were collected once daily between 0730 and 0830 hours.

Two passage chutes were installed, one approximately 9 meters from the left bank and the other approximately 7 meters from the right bank A fish trap was installed on the left passage chute to facilitate efficient biological sampling during various river stage heights. The right passage chute was for use during extreme low water levels or when large numbers of fish began building up below the weir. It was not used in 2006. All fish, except whitefish (Coregoninae), were enumerated to species as they passed through the live trap. Fish were counted 24 hours per day and the numbers were recorded hourly. The trap was kept closed during periods when fish were not being counted.

The weir was cleaned and its integrity visually checked daily. Cleaning consisted of raking debris from the upstream surface of the weir or walking across each panel to submerge it enough to allow the current to wash debris downstream. Repairs were made as necessary.

Biological Data

Adult salmon were identified and counted as they migrated through the weir each day to determine run timing and escapement. A stratified random sampling design (Cochran 1977) was used to collect age, length, and sex ratio information for Chinook and summer chum salmon. Biological sampling commenced at the beginning of each week, and an effort was made to obtain a weekly sample of 160 Chinook and 160 summer chum salmon spread over a minimum four-day period. All target species within the trap were sampled to prevent bias. Non-target species were identified and counted but not sampled. Whitefish species were grouped together under the subfamily Coregoninae.

Fish sampling consisted of identifying salmon species, determining sex, measuring length, collecting scales, and then releasing the fish upstream of the weir. Secondary sex characteristics were utilized to determine sex. Length was measured from mid-eye to the fork of the caudal fin and rounded to the nearest 5 mm. Scales were removed from the preferred area for age

determination (Koo 1962; Devries and Frie 1996). Three scales were collected from each Chinook salmon sampled. One scale was collected from each summer chum salmon sampled. Scale impressions were made on cellulose acetate cards using a heated scale press and examined with a microfiche reader (Zabkar and Harper 2003). Age was determined by an Alaska Department of Fish and Game (ADF&G) biologist and reported according to the European method (Koo 1962). Daily sex ratios were collected by the sexing of each fish when sampling for age and length. The daily escapement counts and sex ratios were reported daily to the USFWS Fairbanks Fish and Wildlife Field Office and the ADF&G field station in Emmonak, Alaska.

Data Analysis

Incomplete 24-h counts were adjusted for a 24-h period. No complete daily counts were missed in 2006, so estimates for missing days were not needed. The annual counts are minimum estimates of escapement since fish may pass by the site undetected before and after the weir is operational. Historical and seasonal totals are presented in Appendices 1-6. Substantial numbers of coho salmon in 1998 and all salmon species in 2001 were missed due to high water; therefore the counts for these years were not included in any annual comparative analyses.

Calculations for age and sex information were treated as a stratified random sample (Cochran 1977), with statistical weeks as the strata. Each statistical week was defined as beginning on Sunday and ending the following Saturday. Within a stratum, the proportion of the samples composed of a given sex or age, $\hat{p}_{ij}$, was calculated as

$$\hat{p}_{ij} = \frac{n_{ij}}{n_j},$$

where n_{ij} is the number of fish by sex *i* or age *i* sampled in week *j*, and n_j is the total number of fish sampled in week *j*. The variance of $\hat{p}_{ij}$ was calculated as

$$\hat{v}(\hat{p}_{ij}) = \frac{\hat{p}_{ij}(1-\hat{p}_{ij})}{n_j - 1}.$$

Sex and age compositions for the total run of Chinook and summer chum salmon of a given sex/age, $\hat{p}_i$ were calculated as

$$\hat{p}_i = \sum_{j-1} \hat{W}_j \hat{p}_{ij,}$$

where the stratum weight $\hat{W}_j$ was calculated as

$$\hat{W}_j = \frac{N_j}{N},$$

and N_j equals the total number of fish of a given species passing through the weir during week j, and N is the total number of fish of a given species passing through the weir during the run. Variance, $\hat{v}(\hat{p}_i)$ of sex and age compositions for the run was calculated as

$$\hat{v}(\hat{p}_i) = \sum_{j-1} \hat{W}_j^2 \hat{v}(\hat{p}_{ij}).$$

Results and Discussion

Weir Operation

In 2006, high water delayed the start date of the weir project, allowing some fish to migrate up the East Fork Andreafsky River without being enumerated. The weir was operational from June 28 through July 27, 2006. The average stage height during weir operations was 119 cm with a range between 98 and 137 cm (Figure 2). Water temperature during weir operations averaged 13°C and ranged between 8 and 16°C (Figure 2).

Picket spacing in the weir panels allowed smaller pink salmon and resident fish to pass unhindered through the weir, yet effectively blocked passage of other salmon and larger fish species (Zabkar and Harper 2003). Consequently, counts of pink salmon, whitefish, Arctic grayling (*Thymallus arcticus*), northern pike (*Esox lucius*), and Dolly Varden (*Salvelinus malma*) were conservative.

Biological Data

An estimated 6,463 Chinook, 102,260 summer chum, 23 coho, 220,735 pink, and 426 sockeye salmon migrated through the weir in 2006 (Table 1). Non-salmon species recorded moving through the weir include 5,829 whitefish, four Arctic grayling, 51 northern pike, and two Dolly Varden. Passage estimates were conservative due to an unknown number of fish passing before and after the weir was operational.

In general, Yukon River Chinook and chum salmon runs have improved since 2001 (JTC 2005). Preliminary ADF&G reports indicated the 2006 Chinook salmon run to be average to below average and summer chum salmon runs to be average in most tributaries (Hayes et al. 2006). However, the East Fork Andreafsky River weir recorded the third highest Chinook salmon weir count since 1994 and the chum salmon run was slightly below average (Figure 3).

Chinook Salmon

The 2006 Chinook salmon escapement estimate (6,463 fish) was 149% of the 1994-2005 historical average of 4,328 fish (Figure 3). It was the third highest return ever recorded at the weir (Appendix 1). Peak passage (2,193 fish) occurred during the week of July 9 to 15 (Table 1; Figure 4). The 2006 run timing was later than average. The first quartile passed on July 8 (yearly average July 5), the median run passage date at the weir was July 12 (yearly average July 10), and the third quartile passage date was July 17 (yearly average July 15; Table 2).

Female Chinook salmon lengths ranged from 530 to 935 mm, and male Chinook salmon ranged from 475 to 975 mm (Table 3). A total of 522 Chinook salmon were sampled for age composition, with 68 (15%) classified as unreadable, principally because of scale regeneration.

The age composition of sampled Chinook salmon included three age groups: age 1.2 (18%), age 1.3 (55%), and age 1.4 (27%; Table 4). Females composed an estimated 44% of the overall escapement (Table 4). The age distributions of female and male Chinook salmon were similar with age 1.3 dominating, 45% for females and 63% for males.

The 2006 ADF&G aerial survey conducted on the Andreafsky River estimated 824 Chinook salmon for the mainstem (Appendix 1). This count was within the Sustainable Escapement Goal of 640 to 1,600 Chinook salmon for the mainstem (Hayes et al. 2006). No count was available for the East Fork Andreafsky River.

Chum Salmon

The 2006 summer chum salmon escapement estimate of 102,260 fish was 139% of the 1994-2005 historical average of 73,589 fish (Figure 3). It was the fourth highest return ever recorded at the weir and fell within the Biological Escapement Goal (BEG) of 65,000 to 135,000 fish (Appendix 1; ADF&G 2004). Peak passage (48,670 fish) occurred during the week of July 2 to 8 (Table 1; Figure 4). The 2006 run timing was about average. The first quartile passed on July 1 (yearly average July1), the median run passage date at the weir was July 4 (yearly average July 5), and the third quartile passage date was July 8 (yearly average July 11; Table 2).

Female summer chum salmon lengths ranged from 435 to 615 mm, and male summer chum salmon ranged from 460 to 680 mm (Table 3). A total of 727 summer chum salmon were sampled for age composition, with 69 (10%) classified as unreadable, principally because of scale regeneration. The age composition of sampled summer chum salmon included four age groups: age 0.2 (1%), age 0.3 (27%), age 0.4 (72%), and age 0.5 (1 male; Table 5). Females comprised an estimated 48% of the overall escapement (Table 5). The age distribution of female and male summer chum salmon were similar with age 0.4 dominating, 68% for females and 77% for males.

Coho Salmon

The 2006 coho salmon escapement estimate was not conducted for the first time since 1995 due to insufficient funding for continuing weir operations into August and September. There were 23 coho salmon that passed through the weir prior to closure. The first coho salmon passed through the weir on July 23, which is early relative to the 1995-2005 historical arrival dates (Appendix 4).

Pink Salmon

Pink salmon have strong returns to the East Fork Andreafsky River during even-numbered years and relatively weak returns during odd-numbered years (Appendix 5). The 2006 escapement through the weir was the fifth highest even-year return (220,735 fish) and was 97% of the even-year 1994-2004 historical average of 227,954 fish (Figure 3). Pink salmon counts on the Andreafsky River are a measure of relative abundance due to small pink salmon being able to pass uncounted between the weir pickets. Peak passage (95,542 fish) occurred during the week of July 16 to 22 (Table 1; Figure 4). The first quartile passed on July 11 at the weir, median run passage date was July 18, while the third quartile passed on July 21 (Table 2).

Sockeye Salmon

The 2006 sockeye salmon escapement estimate of 426 fish was well above the 1995-2005 historical average of 210 fish (Appendix 6). Large populations of sockeye salmon are absent in the Yukon River drainage (Bergstrom et al. 1995), but small populations have been identified in several Yukon River tributaries (Alt 1983; O'Brien 2006), including the Andreafsky River. Peak passage (135 fish) occurred during the week of July 16 - 22 (Table 1). The median run passage date at the weir was July 17, while the first quartile passed on July 7 and the third quartile passed on July 21 (Table 2). Age, sex, and length data for sockeye salmon were collected in 2006 (n = 63 fish). Fin-clip samples for genetic analysis were also obtained. These data will be presented in a future report specific to Yukon River sockeye salmon populations.

Conclusion

The East Fork Andreafsky River weir has been an important tool for monitoring Refuge-originating salmon stocks and assisting both ADF&G and USFWS in-season managers with management of Yukon River fisheries. This project continues to build a long-term database that is unique to the lower Yukon River drainage. The present weir project provides accurate escapement and biological data dating back to 1994 for Chinook, summer chum, and pink salmon, from 1995 to 2005 for coho salmon, and 1995 for sockeye salmon. Prior data from 1981 through 1988 using sonar and tower methodologies and aerial survey data starting in 1954 also add to this important database (Appendix 1). Future weir operations will likely run through the end of the chum salmon run (approximately the first week of August).

Due to the complexity of the Yukon River mixed-stock salmon fishery and the difficulty in managing specific stocks, it is vital to continue collecting information from individual salmon populations, including stocks in the Andreafsky River drainage. It is also recommended that investigations into spawning and rearing locations for sockeye salmon be conducted to assure long-term viability of this small unique population.

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References

Alaska Department of Fish and Game. 2004. Escapement goal review of select AYK Region salmon stocks, January 2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK Region, Regional Information Report 3A04-01, Anchorage, Alaska.

Alt, K. T. 1983. Inventory and cataloging of sport fish and sport fish waters of western Alaska. Alaska Department of Fish and Game, Project F-9-15, Study G-1, Volume 24: 34-71, Juneau, Alaska.

Barton, L. H. 1984. A catalog of Yukon River salmon spawning escapement surveys. Alaska Department of Fish and Game, Division of Commercial Fisheries, Fairbanks, Alaska.

Bergstrom, D. J., A. C. Blaney, K. C. Schultz, R. R. Holder, G. J. Sandone, D. J. Schneiderhan, and L. H. Barton. 1995. Annual management report Yukon area, 1993. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK Region, Regional Information Report 3A95-10, Anchorage, Alaska.

Bergstrom, D. J., K. C. Schultz, B. M. Borba, V. Golembeski, R. D. Paulus, L. H. Barton, D. J. Schneiderhan, and J. S. Hayes. 1998. Annual management report Yukon area, 1997. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK Region, Regional Information Report 3A98-32, Anchorage, Alaska.

Cochran, W. G. 1977. Sampling techniques, third edition. John Wiley and Sons, New York.

Devries, D. R., and R. V. Frie. 1996. Determination of age and growth. Pages 483-512 *in* R. Murphy, and D.W. Willis, editors. Fisheries techniques, second edition. American Fisheries Society, Bethesda, Maryland.

Hayes, S. J., D. Evenson, G. Sandone. 2006. Yukon river Chinook salmon stock status and action plan; a report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK Region, Special Publication 06-38, Anchorage, Alaska.

JTC (United States/Canada Yukon River Joint Technical Committee). 2005. Yukon River salmon 2004 season summary and 2005 season outlook. Prepared by the United States and Canada Yukon River Joint Technical Committee. Whitehorse, Yukon Territory.

JTC (United States/Canada Yukon River Joint Technical Committee). 2006. Yukon River salmon 2005 season summary and 2006 season outlook. Alaska Department of Fish and Game, Division of

Koo, T. S. Y. 1962. Age determination in salmon. Pages 37-48 *in* T.S.Y. Koo, editor. Studies of Alaskan red salmon. University of Washington Press, Seattle, Washington.

Kruse, G. H. 1998. Salmon run failures in 1997-1998: a link to anomalous ocean conditions? Alaska Department of Fish and Game, Alaska Fishery Research Bulletin 5(1):55-63, Juneau, Alaska.

Labelle, M. 1994. A likelihood method for estimating pacific salmon escapement based on fence counts and mark-recapture data. Canadian Journal of Fisheries Aquatic Science 51: 552-556.

Leslie, L. D. 1989. Alaska climate summaries, second edition. Arctic Environmental Information and Data Center, University of Alaska Anchorage, Alaska Climate Center Technical Note 5, Anchorage, Alaska.

Mundy, P. R. 1982. Computation of migratory timing statistics for adult Chinook salmon in the Yukon River, Alaska, and their relevance to fishery management. North American Journal of Fisheries Management 4:359-370.

O'Brien, J. P. 2006. Abundance and run timing of adult salmon in Gisasa River, Koyukuk National Wildlife Refuge, Alaska, 2005. U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Field Office, Alaska Fisheries Data Series 2006-3, Fairbanks, Alaska.

Sandone, G. J. 1989. Anvik and Andreafsky River salmon studies, 1988. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK Region, Regional Information Report 3A89-03, Anchorage, Alaska.

Tobin, J. H. 1994. Construction and performance of a portable resistance board weir for counting migrating adult salmon in rivers. U.S. Fish and Wildlife Service, Kenai Fishery Resource Office, Alaska Fisheries Technical Report 22, Kenai, Alaska.

Tobin, J. H., and K. C. Harper. 1995. Abundance and run timing of adult salmon in the East Fork Andreafsky River, Yukon Delta National Wildlife Refuge, Alaska, 1994. U.S. Fish and Wildlife Service, Kenai Fishery Resource Office, Alaska Fisheries Progress Report 95-5, Kenai, Alaska.

USFWS (U.S. Fish and Wildlife Service). 1991. Fishery management plan for the Yukon Delta National Wildlife Refuge. U.S. Fish and Wildlife Service, Anchorage, Alaska.

Vania, T., V. Golembeski, B. M. Borba, T. L. Lingnau, J. S. Hayes, K. R. Boeck, and W. H. Busher. 2002. Annual management report Yukon and Northern areas 2000. Alaska Department of Fish and Game, Regional Information Report Number 3A02-29, Anchorage, Alaska.

Zabkar, L. M., and K. C. Harper. 2003. Abundance and run timing of adult Pacific salmon in the East Fork Andreafsky River, Yukon Delta National Wildlife Refuge, Alaska, 2001 and 2002. U.S. Fish and Wildlife Service, Kenai Fish and Wildlife Field Office, Alaska Fisheries Data Series 2003-5, Kenai, Alaska.

Table 1. Escapement estimates, by stratum, recorded at the East Fork Andreafsky River weir, Alaska, 2006.

Stratum dates	Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon
Jun 28 - Jul 1	97	29,235	0	692	0
Jul 2 - 8	1,871	48,670	0	27,623	129
Jul 9 - 15	2,193	12,251	0	58,896	75
Jul 16 - 22	2,102	9,725	0	95,542	135
Jul 23 - 27	200	2,379	23	37,982	87
Total	6,463	102,260	23	220,735	426

Table 2. Daily and total estimates of Chinook, summer chum, coho, pink, and sockeye salmon escapement through the East Fork Andreafsky River weir, Alaska, 2006. Partial daily counts, adjusted to 24-hour count, are indicated by *. Run passage by quartile is shown in shaded box.

Date	Chinook salmon		Chum salmon		Coho salmon	Pink salmon		Sockeye salmon	
28-Jun	0		1,272	*	0	43	*	0	
29-Jun	6		2,822		0	54		0	
30-Jun	51		14,912		0	314		0	
1-Jul	40		10,229	25%	0	281		0	
2-Jul	13		2,395		0	134		0	
3-Jul	51		7,291		0	326		9	
4-Jul	128		14,018	50%	0	1,431		50	
5-Jul	276		9,389		0	1,325		15	
6-Jul	437		7,738		0	3,092		27	
7-Jul	574		4,225		0	8,096		16	25%
8-Jul	392	25%	3,614	75%	0	13,219		12	
9-Jul	86		2,351		0	7,941		13	
10-Jul	165		3,478		0	11,605		12	
11-Jul	449		2,631		0	13,327	25%	16	
12-Jul	1,108	50%	1,609		0	14,844		20	
13-Jul	201		725		0	7,204		4	
14-Jul	67		330		0	1,117		3	
15-Jul	117		1,127		0	2,858		7	
16-Jul	262		1,441		0	2,816		5	
17-Jul	714	75%	2,564		0	8,969		18	50%
18-Jul	371		1,637		0	17,205	50%	21	
19-Jul	264		1,294		0	18,690		26	
20-Jul	164		924		0	18,357		21	
21-Jul	161		944		0	13,319	75%	32	75%
22-Jul	166		921		0	16,186		12	
23-Jul	117		715		2	11,435		31	
24-Jul	48		548		5	9,612		19	
25-Jul	25		452		7	6,890		15	
26-Jul	8		334		4	4,746		13	
27-Jul	2		330		5	5,299		9	
Total	6,463		102,260		23	220,735		426	

indicates dates at which 25, 50, and 75 percent of the run had passed the weir.

* partial days count adjusted to 24 hour day.

Table 3. Mid-eye to fork length (mm) at age of female and male Chinook and summer chum salmon sampled at East Fork Andreafsky River weir, Alaska, 2006.

	Female					Male				
Age	N	Mean	Median	SE	Range	N	Mean	Median	SE	Range
					Chinook salmon					
1.2	13	590	580	11.6	530-650	66	564	563	5.7	475-720
1.3	91	741	750	6.3	600-880	161	707	705	4.2	540-860
1.4	94	828	840	5.7	630-935	29	797	800	16.8	570-975
Total	198					256				
					Chum salmon					
0.2	4	471	475	13.6	435-500	2	493	493	7.5	485-500
0.3	155	513	510	2.7	435-600	112	522	545	3.1	460-680
0.4	196	532	530	2.1	450-615	188	575	575	2.4	495-650
0.5	0	0	0	0	0	1	540	540	0.0	540-540
Total	355					303				

Table 4. Age and sex ratio estimates by stratum of Chinook salmon sampled at East Fork Andreafsky River weir, Alaska, 2006. Standard errors are in parentheses. Season totals are calculated from weighted weekly strata totals. Unknown age data are from unreadable scale samples and are listed for informational purposes. They were not included in calculations.

					Brood year and age		
					2002	2001	2000
Strata	Run size (N)	Sample size (n)	Unknown age	Percent female	1.2	1.3	1.4
June 28 - Jul 1	97	6	3	0 (0.0)	17% (16.7)	50% (22.4)	33% (21.1)
July 2 - 8	1871	135	25	54 (4.3)	12% (2.8)	52% (4.3)	36% (4.2)
July 9 - 15	2193	146	14	35 (4.0)	18% (3.2)	58% (4.1)	25% (3.6)
July 16 - 22	2102	107	16	47 (4.8)	22% (4.1)	55% (4.8)	22% (4.1)
July 23 - 27	200	60	10	40 (6.4)	20% (5.2)	60% (6.4)	20% (5.2)
Total	6,463	454	68	44 (2.4)	18% (1.9)	55% (2.5)	27% (2.2)
Female	2,840	198	18		7% (2.0)	45% (3.7)	48% (3.8)
Male	3,623	256	50		26% (2.9)	63% (3.2)	11% (2.0)

Table 5. Age and sex ratio estimates by stratum of summer chum salmon sampled at East Fork Andreafsky River weir, Alaska, 2006. Standard errors are in parentheses. Season totals are calculated from weighted weekly strata totals. Unknown age data are from unreadable scale samples and are listed for informational purposes. They were not included in calculations.

					Brood year and age			
					2003	2002	2001	2000
Strata	Run size (N)	Sample size (n)	Unknown age	Percent female	0.2	0.3	0.4	0.5
June 28 - Jul 1	29,235	87	13	33 (5.1)	0% (0.0)	13% (3.6)	87% (3.6)	0% (0.0)
July 2 - 8	48,670	145	15	53 (4.2)	1% (0.7)	24% (3.6)	75% (3.6)	0% (0.0)
July 9 - 15	12,251	142	18	58 (4.2)	1% (1.0)	46% (4.2)	51% (4.2)	1% (0.7)
July 16 - 22	9,725	102	5	51 (5.0)	0% (0.0)	54% (5.0)	46% (5.0)	0% (0.0)
July 23 - 27	2,379	182	18	63 (3.6)	2% (0.9)	55% (3.7)	43% (3.7)	0% (0.0)
Total	102,260	658	69	48 (2.6)	1% (0.3)	27% (2.1)	72% (2.1)	0% (0.1)
Female	49,199	355	36		1% (0.7)	31% (3.2)	68% (3.2)	0% (0.0)
Male	53,061	303	33		<1% (0.0)	23% (2.8)	77% (2.8)	<1% (0.2)

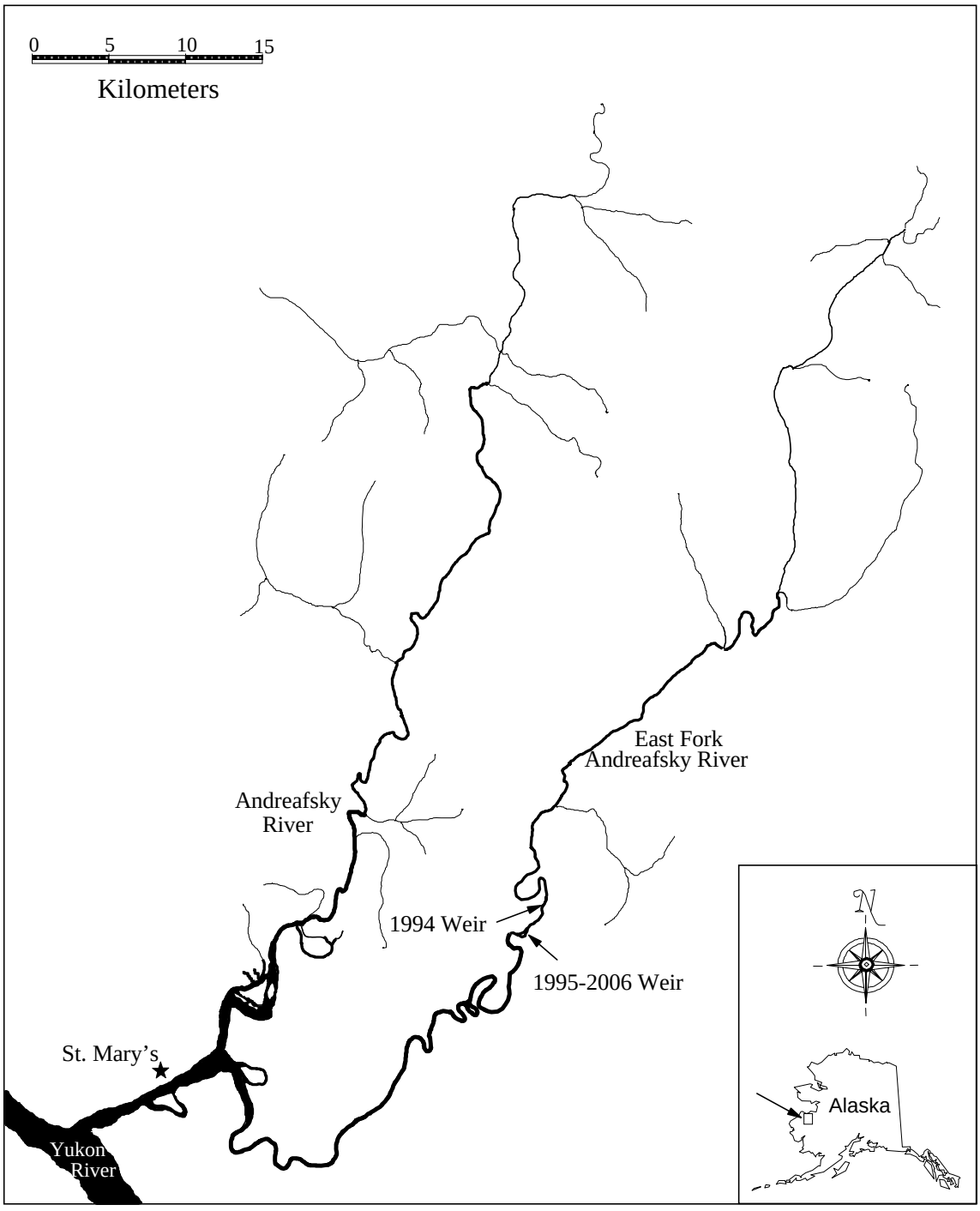

Figure 1. Weir locations in the East Fork Andreafsky River, Alaska, 1994-2006.

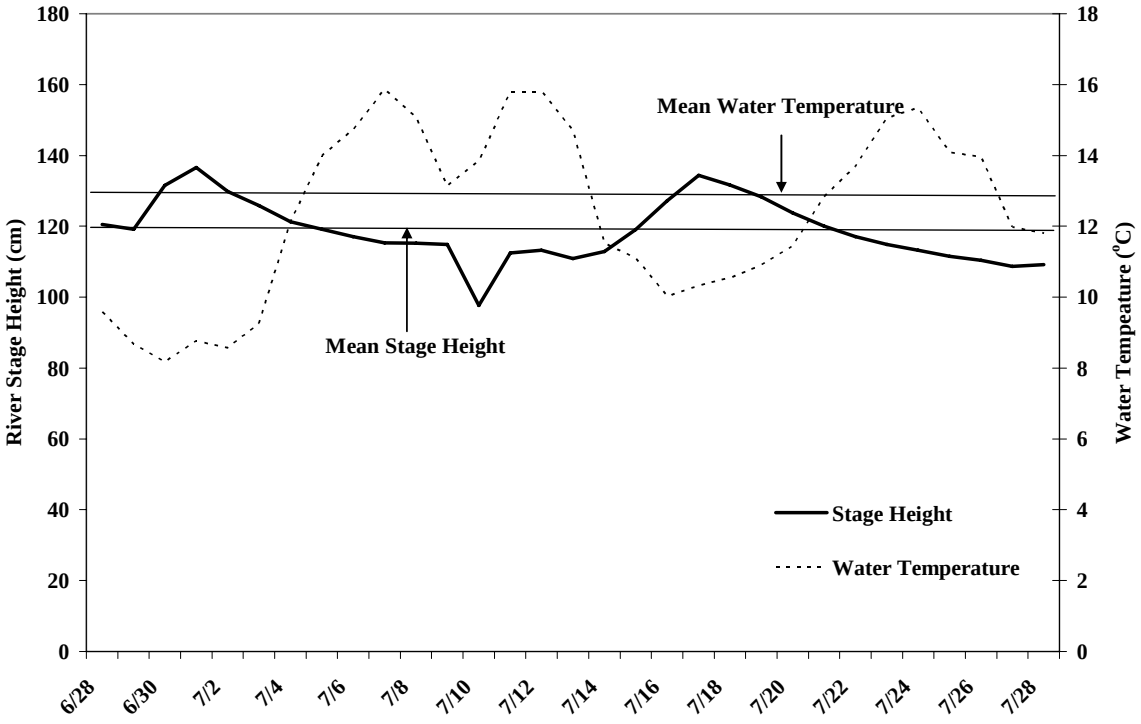

Figure 2. River stage heights and water temperatures at the East Fork Andreafsky River weir, 2006.

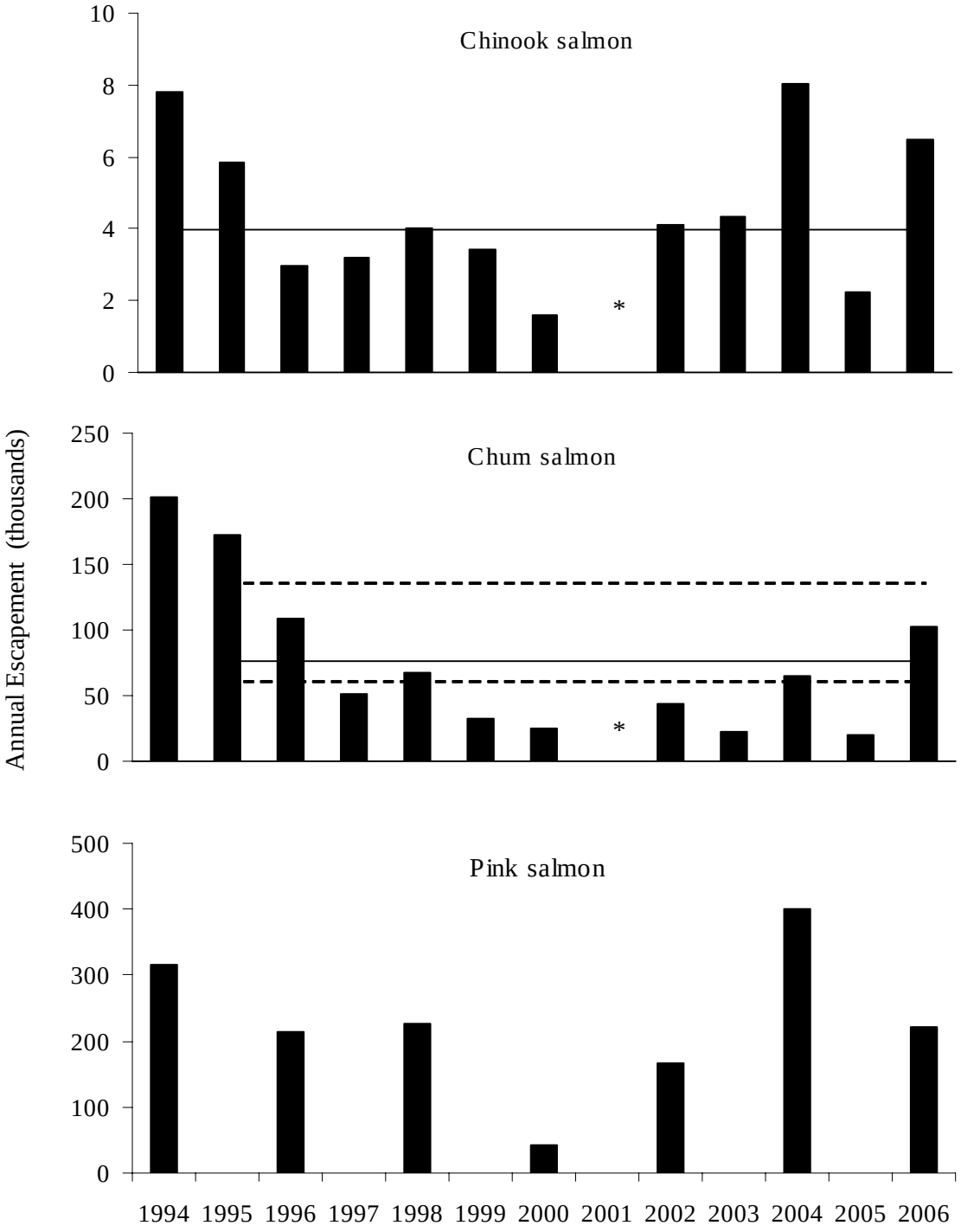

Figure 3. Annual escapement estimates of Chinook, summer chum, and even-year pink salmon migrating through the East Fork Andreafsky River weir, Alaska, 1994 to 2006. Historical average represented by the solid horizontal line. The dotted lines in the chum salmon chart represent the maximum and minimum BEG. Asterisk denotes missing annual count.

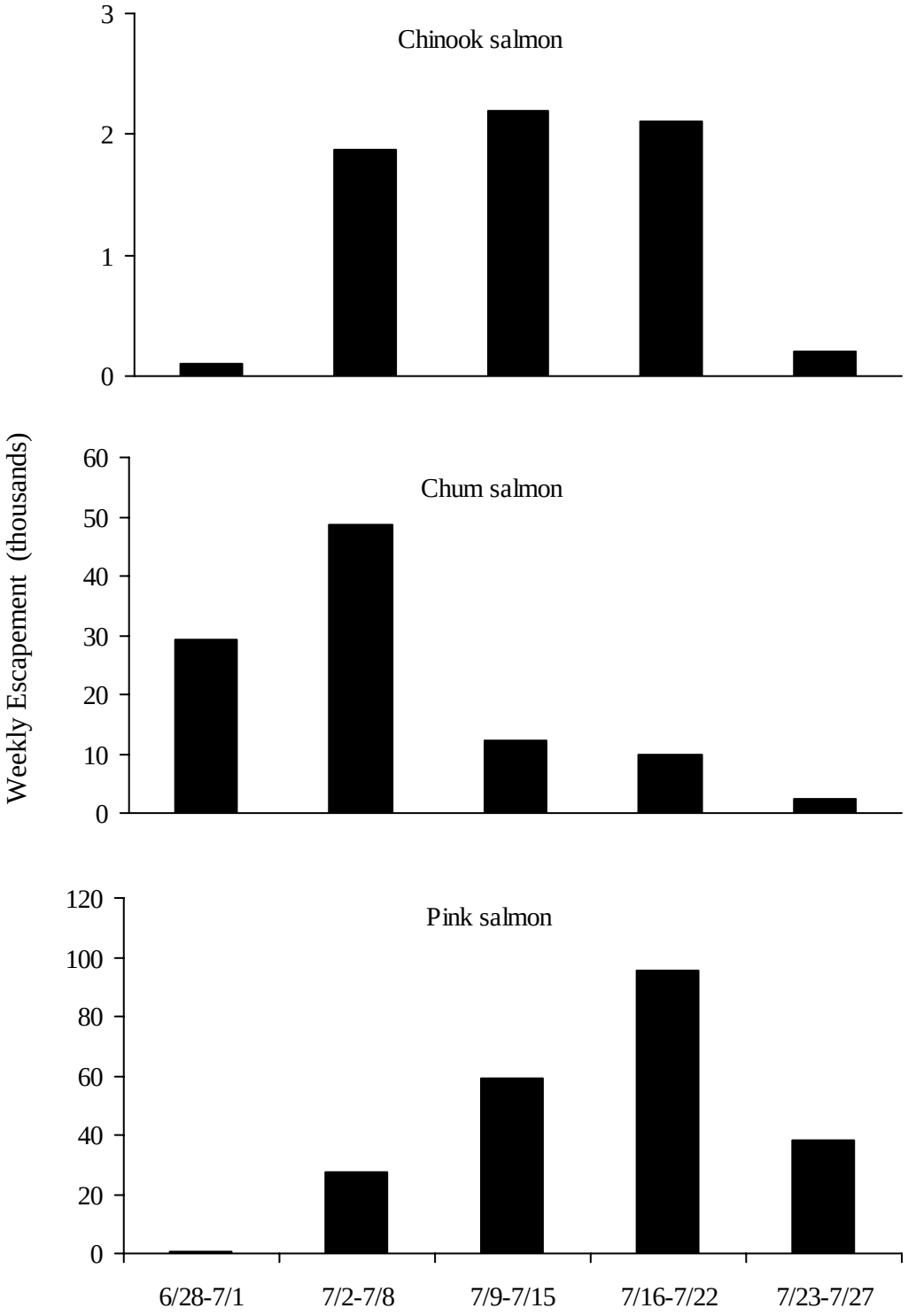

Figure 4.—Weekly Chinook, summer chum, and pink salmon escapement estimates through the East Fork Andreafsky River weir, Alaska, June 28 to July 27, 2006.

Appendix 1. Historical Chinook, summer chum, and coho salmon escapement estimates recorded for the Andreafsky River, Alaska, 1954-2006. Data from Barton, L.H. (1984), Bergstrom et al. (1998), Zabkar and Harper (2003), and ADF&G (2004).

	East Fork Andreafsky River						Main-stem Andreafsky River		
	Aerial Index Estimates			Sonar, Tower, or Weir			Aerial Index Estimates		
Year	Chinook salmon	Chum salmon	Coho salmon	Chinook salmon	Chum salmon	Coho salmon	Chinook salmon	Chum salmon	Coho salmon
1954	*a*	*a*					2,000 *a*	7,000 *a*	
1955									
1956	336 *b*	15,356 *b*							
1957									
1958	50 *b*	3,500 *b*					150 *b*	30,000 *b*	
1959	150 *b*	4,000 *b*					300 *b*	7,000 *b*	
1960	1,020	10,530					1,220	6,016	
1961	1,003	8,110							
1962	675 *b*	18,040					762 *b*	19,530	
1963									
1964	867	8,863					705	12,810	
1965							355 *b*	14,670 *b*	
1966	361	25,619 *b*					303	18,145	
1967							276 *b*	14,495 *b*	
1968	380	17,600					383 *b*	74,600 *b*	
1969	231 *b*	119,000					374 *b*	159,500 *b*	
1970	665	84,090					574 *b*	91,710 *b*	
1971	1,904	98,095					1,682	71,745	
1972	798 *b*	41,460 *b*					582 *b*	25,573	
1973	825	10,149 *b*					788	51,835	
1974		3,215 *b*					285	33,578	
1975	993	223,485					301	235,954	
1976	818	105,347					643	118,420	
1977	2,008	112,722					1,499	63,120	
1978	2,487	127,050					1,062	57,321	
1979	1,180	66,471					1,134	43,391	
1980	958 *b*	36,823 *b*					1,500	115,457	
1981	2,146 *b*	81,555	1,657 *b*	5,343 *c*	147,312 *c*		231 *b*		
1982	1,274	7,501 *b*			180,078 *c*		851	7,267 *b*	
1983				2,720 *c*	110,608 *c*				
1984	1,573 *b*	95,200 *b*			70,125 *c*		1,993	238,565	
1985	1,617	66,146					2,248	52,750	
1986	1,954	83,931		1,530 *d*	167,614 *d*		3,158	99,373	
1987	1,608	6,687 *b*		2,011 *d*	45,221 *d*		3,281	35,535	
1988	1,020	43,056	1,913	1,339 *d*	68,937 *d*		1,448	45,432	830
1989	1,399	21,460 *b*					1,089		
1990	2,503	11,519 *b*					1,545	20,426 *b*	
1991	1,938	31,886					2,544	46,657	
1992	1,030 *b*	11,308 *b*					2,002 *b*	37,808 *b*	
1993	5,855	10,935 *b*					2,765	9,111 *b*	
1994	300 *b*			7,801	200,981 *f*		213 *b*		
1995	1,635			5,841	172,148	10,901	1,108		
1996				2,955	108,450	8,037	624		
1997	1,140			3,186	51,139	9,472	1,510		
1998	1,027			4,034	67,720	5,417 *e*	1,249 *b*		
1999				3,444	32,587	2,963	870 *b*		

Appendix 1. Continued.

	East Fork Andreafsky River						Main-stem Andreafsky River		
	Aerial Index Estimates			Sonar, Tower, or Weir			Aerial Index Estimates		
Year	Chinook salmon	Chum salmon	Coho salmon	Chinook salmon	Chum salmon	Coho salmon	Chinook salmon	Chum salmon	Coho salmon
2000	1,018			1,609	24,785	8,451	427		
2001	1,065			1,148 *f*	2,134 *f*	15,896 *e*	570		
2002	1,447			4,123	44,194	3,577	977		
2003				4,336	22,461	8,231	1,578 *b*		
2004	2,879			8,045	64,883	11,146	1,317		
2005	1,715			2,239	20,127	5,303	1,492		
2006				6,463	102,260	23 *g*	824		
SEG *h*	960 - 1,900						640 - 1,600		
BEG *i*					65,000 - 135,000				

a Counts for both forks were combined into Andreafsky River count
b Incomplete survey and/or poor survey timing or conditions resulting in minimal or inaccurate count
c Sonar count
d Tower count
e Incomplete count, missing data not estimated
f Weir installed too late for an accurate count
g Incomplete count, weir removed
h Sustainable Escapement Goal
i Biological Escapement Goal

Appendix 2. Historical daily Chinook salmon escapements recorded at the East Fork Andreafsky River weir 1994-2006. Data for 2001 were not used in calculations and are shown for informational purposes only.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
15-Jun				0									
16-Jun		0		0									
17-Jun		0		0		0							
18-Jun		0		0		0							
19-Jun		0	0	0		0			0	0			
20-Jun		1	0	0		0			0	0			
21-Jun		0	10	0		0			1	0			
22-Jun		1	0	0		0			20	0			
23-Jun		0	33	14	0	0			0	4	67		
24-Jun		2	6	21	0	0			0	2	26		
25-Jun		0	0	59	0	0			3	7	15		
26-Jun		0	59	0	0	0			1	3	55	16	
27-Jun		41	42	101	1	0			26	12	181	2	
28-Jun		48	19	11	0	0			314	19	534	42	0
29-Jun	1	67	6	1	10	0			119	4	290	88	6
30-Jun	188	104	8	0	34	47	9		27	0	461	238	51
1-Jul	141	81	72	75	93	19	16		319	176	582	11	40
2-Jul	54	71	21	24	17	9	39		105	295	25	89	13
3-Jul	222	17	205	29	36	0	89		230	22	375	135	51
4-Jul	156	55	124	49	75	12	74		5	6	353	114	128
5-Jul	651	107	309	98	336	97	38		20	83	263	111	276
6-Jul	225	678	258	356	373	42	407		356	136	1,187	154	437
7-Jul	1,156	433	280	227	386	114	18		307	336	878	271	574
8-Jul	108	155	244	123	204	197	71		130	469	463	169	392
9-Jul	351	260	186	49	129	216	17		178	823	503	46	86
10-Jul	375	250	111	64	167	256	30		191	48	368	7	165
11-Jul	288	382	72	69	255	507	57		264	107	122	15	449
12-Jul	581	1,022	52	88	138	214	35		166	345	315	9	1,108
13-Jul	779	697	100	15	62	331	55		191	311	106	58	201
14-Jul	433	375	96	16	61	97	18		158	340	105	108	67
15-Jul	352	292	62	124	91	22	90	169	140	2	53	49	117
16-Jul	389	97	95	274	197	33	76	87	210	7	58	55	262
17-Jul	144	46	110	91	263	75	62	41	119	25	54	30	714
18-Jul	285	38	55	25	184	63	48	196	94	235	29	14	371
19-Jul	161	25	42	70	240	65	34	71	75	158	40	22	264
20-Jul	53	37	69	264	67	302	22	107	50	28	57	17	164
21-Jul	66	74	51	148	129	55	12	175	29	10	40	50	161
22-Jul	62	33	26	35	117	67	21	66	12	2	13	51	166
23-Jul	209	24	2	103	57	15	6	15	32	23	17	15	117
24-Jul	149	7	4	57	66	54	11	5	16	58	12	22	48
25-Jul	25	78	6	0	12	24	10	17	7	31	19	46	25
26-Jul	51	21	3	11	8	5	9	7	3	4	5	4	8
27-Jul	92	12	6	3	8	34	7	17	6	22	14	4	2
28-Jul	20	15	16	29	11	6	3	10	3	108	23	4	
29-Jul	10	9	13	58	23	159	57	41	4	28	19	0	
30-Jul	13	5	7	144	31	80	4	16	2	4	7	4	
31-Jul	10	1	10	2	17	59	20	11	46	0	15	3	
1-Aug	1	8	4	8	20	38	12	8	55	2	13	2	
2-Aug		2	2	4	4	18	4	12	48	5	4	2	
3-Aug		13	2	128	11	42	24	4	10	1	3	8	
4-Aug		5	5	2	1	11	19	8	3	1	6	4	

Appendix 2. Continued.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
5-Aug		6	6	1	7	5	14	6	3	4	5	8	
6-Aug		6	2	0	9	2	9	1	4	0	10	4	
7-Aug		19	7	1	10	1	4	11	4	1	8	3	
8-Aug		20	3	2	3	4	7	0	0	3	6	2	
9-Aug		25	2	2	5	0	10	4	0	1	13	9	
10-Aug		25	5	1	7	1	3	2	0	0	39	35	
11-Aug		7	2	1	1	2	8	1	4	1	17	14	
12-Aug		4	3	7	8	5	4	1	0	1	23	2	
13-Aug		11	0	14	7	3	1	10	1	2	21	2	
14-Aug		2	0	18	1	9	3	0	1	3	19	5	
15-Aug		2	0	26	0	2	6	11	0	3	17	7	
16-Aug		3	3	2	12	4	2	8	0	2	16	3	
17-Aug		3	0	4	9	7	1	2	3	1	14	1	
18-Aug		3	2	3	5	3	2	2	0	1	10	3	
19-Aug		2	2	3	2	0	2	2	1	2	9	3	
20-Aug		1	3	2	2	6	3	1	0	2	6	2	
21-Aug		2	3	1	2	0	1	0	0	0	8	2	
22-Aug		0	0	4	1	1	1	1	5	0	5	0	
23-Aug		1	2	2	1	0	0	0	0	0	1	5	
24-Aug		1	0	1	1	0	1	1	1	2	3	0	
25-Aug		0	0	4	1	0	0	0	0	2	1	1	
26-Aug		0	1	0	1	1	2	0	0	1	0	3	
27-Aug		0	0	0	0	1	0	0	0	0	1	3	
28-Aug		3	0	1	0	0	0	0	0	0	0	7	
29-Aug		1	2	2	0	0	0	0	0	0	0	6	
30-Aug		0	1	3	1	0	0	0	1	0	4	5	
31-Aug		0	2	1	1	0	0	0	0	0	2	2	
1-Sep		1	0	0	0	0	0	0	0	0	2	3	
2-Sep		0	0	0	0	1	1	0	0	0	0	3	
3-Sep		0	0	4	0	0	0	0	0	0	0	2	
4-Sep		0	0	0	0	0	0	0	0	0	1	3	
5-Sep		1	0	1	0	1	0	0	0	0	1	1	
6-Sep		0	1	1	0	0	0	0	0	0	2	0	
7-Sep		0	0	0	1	0	0	0	0	0	0	0	
8-Sep		3	0	2	0	0	0	0	0	0	1	1	
9-Sep		0	0	1	1	0	0	0	0	1	1	0	
10-Sep		0	0	0	0	0	0	0	0	0	0	0	
11-Sep		0	0	0	1	0	0	0	0	0	2	0	
12-Sep		0	0	2	0		0	0	0	0	0		
13-Sep			0	0	0		0	0	0	0	0		
14-Sep			0				0	0	0	0	0		
15-Sep			0				0	1		1	0		
16-Sep			0				0				0		
17-Sep			0				0				1		
18-Sep							0				0		
19-Sep							0				1		
20-Sep							0						
21-Sep							0						
22-Sep							0						
23-Sep							0						
Total	7,801	5,841	2,955	3,186	4,034	3,444	1,609	**	4,123	4,336	8,045	2,239	6,463

= estimated escapement counts
= adjusted escapement counts
** = incomplete count, missing data not estimated

Appendix 3. Historical daily summer chum salmon estimates recorded at the East Fork Andreafsky River weir 1994-2006. Data for 2001 were not used in calculations and are shown for informational purposes only.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2,005	2006
15-Jun				0									
16-Jun		52		1									
17-Jun		332		4		0							
18-Jun		191		71		0							
19-Jun		423	62	539		0			0	0			
20-Jun		2,198	424	981		0			0	0			
21-Jun		861	3,315	192		0			117	2			
22-Jun		1,170	1,036	53		0			1,782	87			
23-Jun		228	11,195	3,141	13	1			0	564	3,045		
24-Jun		1,951	798	1,620	18	1			6	182	1,062		
25-Jun		364	303	1,422	264	0			522	484	985		
26-Jun		504	7,306	208	175	7			694	183	2,467	256	
27-Jun		12,620	3,435	1,691	535	8			2,448	396	4,638	9	
28-Jun		11,201	1,463	1,196	65	0			6,754	546	8,461	424	1,272
29-Jun	609	9,256	2,335	61	3,153	331			1,765	219	3,807	473	2,822
30-Jun	19,254	10,938	314	80	4,585	4,459	837		836	271	7,081	432	14,912
1-Jul	12,435	8,654	9,164	1,537	4,003	765	1,725		4,403	928	1,590	239	10,229
2-Jul	2,840	5,553	3,326	619	652	459	1,460		2,467	339	153	1,081	2,395
3-Jul	4,973	2,710	8,973	756	1,687	24	1,750		2,291	713	5,689	1,063	7,291
4-Jul	13,321	10,678	10,018	1,264	3,561	3,000	2,070		28	175	3,940	1,238	14,018
5-Jul	12,552	10,026	7,355	831	7,996	4,605	2,300		347	484	2,011	993	9,389
6-Jul	4,043	23,584	3,351	3,428	6,030	1,185	3,717		4,423	1,051	1,791	1,218	7,738
7-Jul	27,527	8,514	3,124	2,980	4,696	1,619	72		2,254	1,376	2,474	1,839	4,225
8-Jul	5,251	732	4,771	2,440	3,088	1,569	1,548		845	2,476	2,096	1,270	3,614
9-Jul	3,883	4,808	3,500	1,799	845	1,754	942		2,265	2,025	1,990	1,112	2,351
10-Jul	12,416	6,473	2,303	3,195	1,003	2,135	727		1,732	244	2,069	1,370	3,478
11-Jul	6,896	6,072	1,275	1,792	4,003	1,897	855		1,221	412	1,609	195	2,631
12-Jul	8,424	3,973	1,497	1,738	4,401	501	477		1,099	1,762	1,815	197	1,609
13-Jul	14,628	4,552	1,680	1,062	829	710	911		1,055	586	1,071	1,458	725
14-Jul	11,611	2,990	1,038	1,302	1,248	1,223	352		544	254	896	1,242	330
15-Jul	8,275	2,874	935	3,222	2,160	412	638	196	1,014	33	605	557	1,127
16-Jul	4,690	3,449	1,280	2,441	2,747	507	551	133	581	123	569	449	1,441
17-Jul	4,886	2,739	774	1,150	3,038	547	464	95	420	445	465	196	2,564
18-Jul	4,532	1,495	852	715	1,580	494	377	229	492	1,078	326	246	1,637
19-Jul	2,977	651	1,848	624	1,365	666	290	102	392	708	217	141	1,294
20-Jul	1,091	1,150	1,721	1,220	370	816	206	74	192	681	276	523	924
21-Jul	1,351	807	1,116	800	335	242	424	228	153	283	142	493	944
22-Jul	2,228	591	605	668	304	240	280	72	61	47	59	182	921
23-Jul	1,320	742	246	405	248	201	116	29	201	306	77	167	715
24-Jul	868	290	291	313	200	173	84	32	98	222	116	54	548
25-Jul	1,349	1,214	196	121	220	131	159	155	26	348	171	80	452
26-Jul	1,977	521	365	339	166	73	130	116	22	218	85	28	334
27-Jul	2,196	605	278	400	130	132	64	110	60	220	69	32	330
28-Jul	841	265	738	219	202	92	43	88	123	389	73	100	
29-Jul	564	211	334	234	145	245	173	78	17	220	52	112	
30-Jul	524	248	272	131	115	242	70	37	36	61	37	74	
31-Jul	410	94	260	86	140	200	172	10	119	80	34	79	
1-Aug	239	160	93	134	191	158	89	24	81	104	17	50	
2-Aug		81	158	81	91	118	125	40	33	111	21	25	
3-Aug		147	91	182	76	124	109	28	36	40	28	23	
4-Aug		59	192	48	56	117	83	17	40	91	22	5	

Appendix 3. Continued.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
5-Aug		77	132	101	73	45	57	13	3	182	25	24	
6-Aug		115	215	77	71	17	31	2	7	52	31	30	
7-Aug		76	163	29	104	11	5	7	13	85	33	14	
8-Aug		78	54	31	77	16	12	7	5	44	16	19	
9-Aug		70	110	44	34	10	10	7	5	21	36	9	
10-Aug		61	137	17	57	32	13	4	13	21	26	8	
11-Aug		35	63	14	39	14	10	4	11	27	34	18	
12-Aug		60	65	65	77	29	9	3	2	40	26	10	
13-Aug		73	26	36	100	16	22	15	0	21	30	3	
14-Aug		62	35	33	58	6	13	9	0	52	35	7	
15-Aug		49	59	31	34	10	4	9	1	43	39	9	
16-Aug		95	80	46	32	13	4	11	6	35	44	8	
17-Aug		64	35	37	27	10	5	6	1	27	48	5	
18-Aug		83	33	58	21	6	13	6	2	19	18	11	
19-Aug		41	110	43	16	3	5	10	0	32	7	0	
20-Aug		45	33	95	15	3	3	7	2	22	12	1	
21-Aug		47	64	54	13	19	0	7	0	21	5	3	
22-Aug		43	27	37	12	2	1	3	2	10	4	2	
23-Aug		35	37	31	10	6	2	10	3	12	3	25	
24-Aug		35	26	41	9	5	4	5	3	11	14	4	
25-Aug		56	103	41	8	5	6	4	3	24	5	6	
26-Aug		53	35	18	6	2	19	2	1	13	2	3	
27-Aug		57	26	20	5	9	17	3	0	11	2	3	
28-Aug		31	39	38	3	7	13	3	1	5	10	20	
29-Aug		53	78	57	2	5	10	1	0	14	8	22	
30-Aug		34	66	73	4	11	9	4	0	6	19	24	
31-Aug		63	31	21	11	13	2	11	0	2	20	12	
1-Sep		48	38	14	8	18	6	10	0	1	22	7	
2-Sep		75	40	13	4	19	5	9	0	1	14	10	
3-Sep		36	49	53	5	15	4	8	0	5	5	28	
4-Sep		25	48	28	8	5	2	7	0	0	5	9	
5-Sep		30	37	38	1	4	1	6	0	0	16	4	
6-Sep		50	29	31	8	4	1	6	0	2	8	13	
7-Sep		60	50	51	6	3	1	5	1	4	11	7	
8-Sep		96	39	28	4	2	0	4	0	2	12	6	
9-Sep		42	32	22	3	2	0	3	0	3	4	3	
10-Sep		42	32	24	9	3	9	2	2	1	3	8	
11-Sep		37	24	48	10	4	3	0	1	0	6	7	
12-Sep		15	16	42	3		5	1	8	16	2		
13-Sep			18	23	4		1	1	2	3	6		
14-Sep			39				2	3	1	1	3		
15-Sep			33				5	3		3	3		
16-Sep			38				18				2		
17-Sep							3				5		
18-Sep							6				0		
19-Sep							4				3		
20-Sep							8						
21-Sep							10						
22-Sep							1						
23-Sep							1						
Total	200,981	172,148	108,450	51,139	67,720	32,587	24,785	2,134	44,194	22,461	64,883	20,127	102,260

= estimated escapement counts
= adjusted escapement counts
** = incomplete count, missing data not estimated

Appendix 4. Historical daily coho salmon estimates recorded at the East Fork Andreafsky River weir, 1995-2006. Data for 1998 and 2001 were not used in calculations and are shown for informational purposes only. There was no targeted coho salmon count in 2006.

Date	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2,005	2006
15-Jun			0									
16-Jun	0		0									
17-Jun	0		0		0							
18-Jun	0		0		0							
19-Jun	0	0	0		0			0	0			
20-Jun	0	0	0		0			0	0			
21-Jun	0	0	0		0			0	0			
22-Jun	0	0	0		0			0	0			
23-Jun	0	0	0	0	0			0	0	0		
24-Jun	0	0	0	0	0			0	0	0		
25-Jun	0	0	0	0	0			0	0	0		
26-Jun	0	0	0	0	0			0	0	0	0	
27-Jun	0	0	0	0	0			0	0	0	0	
28-Jun	0	0	0	0	0			0	0	0	0	0
29-Jun	0	0	0	0	0			0	0	0	0	0
30-Jun	0	0	0	0	0	0		0	0	0	0	0
1-Jul	0	0	0	0	0	0		0	0	0	0	0
2-Jul	0	0	0	0	0	0		0	0	0	0	0
3-Jul	0	0	0	0	0	0		0	0	0	0	0
4-Jul	0	0	0	0	0	0		0	0	0	0	0
5-Jul	0	0	0	0	0	0		0	0	0	0	0
6-Jul	0	0	0	0	0	0		0	0	0	0	0
7-Jul	0	0	0	0	0	0		0	0	0	0	0
8-Jul	0	0	0	0	0	0		0	1	0	0	0
9-Jul	0	0	0	0	0	0		0	0	0	0	0
10-Jul	0	0	0	0	0	0		0	0	0	0	0
11-Jul	0	0	0	0	0	0		0	0	0	0	0
12-Jul	0	0	0	0	0	0		0	0	0	0	0
13-Jul	0	0	0	0	0	0		0	0	0	0	0
14-Jul	0	0	0	0	0	0		0	0	0	0	0
15-Jul	0	0	0	0	0	0	0	0	2	0	0	0
16-Jul	0	0	0	0	0	0	0	0	0	0	0	0
17-Jul	0	0	0	0	0	0	0	0	0	0	0	0
18-Jul	0	0	0	0	0	0	0	0	0	0	0	0
19-Jul	0	0	0	0	0	0	0	0	0	1	0	0
20-Jul	0	0	0	0	0	0	0	0	1	0	0	0
21-Jul	0	0	0	0	0	0	0	0	0	0	0	0
22-Jul	0	0	0	0	0	0	0	0	0	0	0	0
23-Jul	0	11	0	0	0	0	0	0	0	0	0	2
24-Jul	0	2	0	0	0	0	0	0	2	0	0	5
25-Jul	0	1	0	0	0	0	0	0	0	0	0	7
26-Jul	0	4	0	0	0	0	0	0	0	0	0	4
27-Jul	0	0	0	0	0	0	0	0	0	0	0	5
28-Jul	0	3	0	1	0	0	0	0	0	2	0	0
29-Jul	0	3	0	0	0	0	0	0	0	0	0	
30-Jul	0	9	0	1	0	1	0	0	1	1	0	
31-Jul	0	25	0	0	0	1	0	0	2	2	0	
1-Aug	0	1	0	0	0	7	0	0	0	1	1	
2-Aug	0	7	0	1	0	9	0	0	1	4	0	
3-Aug	1	4	0	5	0	18	0	0	1	0	0	
4-Aug	0	15	0	8	9	16	0	1	1	0	1	

Appendix 4. Continued.

Date	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
5-Aug	0	20	0	8	4	14	0	0	2	8	0	
6-Aug	0	10	0	5	4	13	0	0	4	10	0	
7-Aug	1	26	1	16	0	12	0	0	28	14	1	
8-Aug	1	20	0	9	0	35	0	0	25	16	4	
9-Aug	3	26	0	5	1	79	0	0	27	98	2	
10-Aug	8	138	0	8	2	125	0	1	5	62	2	
11-Aug	12	105	0	3	2	89	0	0	9	115	0	
12-Aug	5	50	10	4	5	51	0	0	19	86	0	
13-Aug	3	16	47	111	1	211	0	0	40	78	0	
14-Aug	3	11	35	71	1	137	1	0	194	71	4	
15-Aug	9	19	6	9	0	64	22	0	146	63	9	
16-Aug	5	276	8	61	5	34	33	0	98	56	37	
17-Aug	11	92	7	44	2	23	5	0	50	48	6	
18-Aug	24	179	12	26	0	137	5	0	2	163	173	
19-Aug	41	1,052	13	8	0	108	51	1	7	384	24	
20-Aug	24	100	50		1	333	532	0	21	170	4	
21-Aug	95	149	414		42	303	270	0	11	185	2	
22-Aug	246	9	222		48	59	312	3	3	150	2	
23-Aug	305	32	22		0	10	343	6	24	80	21	
24-Aug	414	12	16		26	44	583	3	263	185	101	
25-Aug	245	1,539	577		8	533	217	7	1,744	243	19	
26-Aug	692	449	150		4	1,401	857	0	634	453	102	
27-Aug	1,436	5	10		4	1,643	382	0	288	17	128	
28-Aug	368	1	24		3	279	403	2	197	4	1,084	
29-Aug	938	179	2,335	371	0	626	103	0	243	38	475	
30-Aug	335	1,489	2,714	618	2	278	1,078	0	552	178	647	
31-Aug	265	374	122	568	1	192	2,264	0	729	490	218	
1-Sep	444	374	73	336	411	358	1,576	0	172	505	23	
2-Sep	863	147	53	17	162	238		14	107	897	23	
3-Sep	14	100	421	80	1,255	162		29	9	234	476	
4-Sep	29	250	355	490	704	160		43	646	167	483	
5-Sep	6	337	219	228	122	39		640	275	609	77	
6-Sep	21	78	514	591	40	46		738	14	1,550	128	
7-Sep	164	84	435	12	0	52		413	42	1,011	207	
8-Sep	2,403	24	169	0	14	48		345	459	578	80	
9-Sep	854	16	223	94	19	55		103	268	337	194	
10-Sep	391	1	52	555	41	94	85	237	9	535	343	
11-Sep	127	0	83	1,104	20	31	30	117	211	259	202	
12-Sep	95	0	64	6		79	20	726	231	13		
13-Sep		0	16	13		30	43	113	399	57		
14-Sep		0				22	21	35	8	37		
15-Sep		3				16	16		4	201		
16-Sep		160				28				240		
17-Sep						19				241		
18-Sep						3				42		
19-Sep						5				157		
20-Sep						5						
21-Sep						34						
22-Sep						32						
23-Sep						10						
Total	10,901	8,037	9,472	* *	2,963	8,451	* *	3,577	8,231	11,146	5,303	**

= estimated escapement count
= partial day's count adjusted to 24 hours
* * = incomplete count, missing data not estimated.

Appendix 5. Historical daily pink salmon escapement estimates recorded at the East Fork Andreafsky River weir, 1994-2006. Data for 2001 were not used in calculations and are shown for informational purposes only.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
15-Jun				0									
16-Jun		0		0									
17-Jun		0		0		0							
18-Jun		0		0		0							
19-Jun		0	12	0		0			0	0			
20-Jun		0	4	0		0			0	0			
21-Jun		0	40	0		0			52	0			
22-Jun		0	42	0		0			462	0			
23-Jun		0	157	0	0	0			0	0	19		
24-Jun		0	67	0	0	0			22	0	15		
25-Jun		0	24	0	8	0			148	3	24		
26-Jun		0	153	0	3	0			338	0	102	0	
27-Jun		1	218	1	22	0			431	6	189	2	
28-Jun		0	80	0	2	0			7,808	4	341	10	43
29-Jun	8	2	78	0	112	0			5,076	3	374	27	54
30-Jun	451	3	41	0	258	0	18		1,509	0	1,671	97	314
1-Jul	409	13	184	2	750	0	5		6,192	16	1,049	15	281
2-Jul	194	4	107	0	65	0	383		3,345	12	140	89	134
3-Jul	305	4	347	0	704	0	52		6,876	13	1,186	453	326
4-Jul	780	5	1,254	1	1,008	0	224		257	13	2,327	652	1,431
5-Jul	1,027	9	6,678	0	3,595	0	162		1,626	16	5,175	985	1,325
6-Jul	772	98	4,676	2	4,136	2	1,228		13,433	24	4,203	2,334	3,092
7-Jul	4,026	77	3,834	0	4,292	2	354		10,268	94	17,994	3,071	8,096
8-Jul	1,736	4	7,472	1	2,968	1	972		4,815	172	13,079	2,443	13,219
9-Jul	4,263	18	8,905	2	1,382	2	1,680		8,765	259	16,044	1,692	7,941
10-Jul	4,744	33	10,290	1	1,169	10	897		12,942	16	22,171	1,266	11,605
11-Jul	3,313	23	5,822	2	9,872	20	7,849		10,764	43	15,664	1,453	13,327
12-Jul	8,447	100	4,662	4	21,285	17	2,726		9,207	185	15,661	385	14,844
13-Jul	13,568	109	9,484	6	11,399	18	7,044		9,161	173	15,313	2,865	7,204
14-Jul	24,842	94	11,760	1	5,846	7	1,468		7,819	189	25,780	5,106	1,117
15-Jul	22,460	81	9,754	35	21,785	2	966	10	6,958	28	16,578	2,489	2,858
16-Jul	20,612	64	13,476	31	11,087	2	1,206	4	8,224	13	22,322	1,992	2,816
17-Jul	27,053	60	12,222	13	23,930	4	1,446	5	6,724	96	16,143	678	8,969
18-Jul	18,277	31	12,682	5	31,639	4	1,686	26	8,701	702	14,713	945	17,205
19-Jul	20,792	15	14,282	6	27,014	14	1,926	15	6,058	459	15,635	450	18,690
20-Jul	23,511	30	17,477	4	7,204	69	2,170	47	1,983	288	28,631	1,140	18,357
21-Jul	10,872	40	18,780	4	4,672	38	2,549	61	1,239	98	19,851	1,852	13,319
22-Jul	8,975	48	13,018	4	2,460	41	1,143	19	564	18	12,446	814	16,186
23-Jul	17,692	77	4,744	5	3,512	25	454	18	1,060	107	9,880	723	11,435
24-Jul	15,120	25	3,778	2	7,181	23	609	38	1,092	107	9,973	256	9,612
25-Jul	3,566	216	2,473	0	5,278	22	1,055	124	385	124	12,352	158	6,890
26-Jul	10,225	88	3,365	6	3,496	11	335	53	429	43	12,184	425	4,746
27-Jul	13,821	37	3,768	13	1,186	24	731	68	232	47	10,978	307	5,299
28-Jul	15,302	20	5,036	9	1,496	11	612	94	305	130	9,686	889	
29-Jul	9,736	14	1,035	20	1,134	26	415	56	49	140	7,911	744	
30-Jul	6,159	29	205	26	982	13	202	22	62	29	5,421	687	
31-Jul	2,476	11	706	2	1,315	10	244	10	232	65	4,258	341	
1-Aug	996	22	169	7	962	8	145	17	131	69	2,669	430	
2-Aug		23	107	2	474	5	129	19	61	54	2,342	140	
3-Aug		44	127	8	440	48	81	17	73	33	1,206	79	
4-Aug		20	300	3	303	60	65	12	34	34	843	55	

Appendix 5. Continued.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
5-Aug		17	237	3	127	28	49	5	11	35	890	91	
6-Aug		22	61	1	73	14	33	10	13	17	729	114	
7-Aug		37	109	1	104	13	17	10	7	20	789	41	
8-Aug		20	61	5	140	19	17	0	4	9	513	68	
9-Aug		29	55	1	68	7	35	3	5	8	439	39	
10-Aug		46	77	4	36	16	15	6	9	9	384	17	
11-Aug		18	44	7	40	15	11	10	2	6	205	23	
12-Aug		11	51	6	43	17	8	3	4	10	152	10	
13-Aug		12	25	4	52	8	14	8	1	14	140	3	
14-Aug		32	16	3	40	5	11	6	4	21	128	11	
15-Aug		20	7	0	11	3	9	2	1	16	116	10	
16-Aug		19	25	3	18	17	2	1	0	11	104	12	
17-Aug		17	8	5	0	1	1	1	1	6	96	5	
18-Aug		6	17	4	0	6	1	1	0	1	34	3	
19-Aug		7	40	2	2	0	3	6	0	14	35	1	
20-Aug		4	4	4	0	1	3	1	0	18	17	0	
21-Aug		7	2	1	0	1	1	0	1	10	17	3	
22-Aug		6	3	2	0	3	2	1	1	8	7	0	
23-Aug		4	8	2	0	2	1	3	2	12	5	0	
24-Aug		8	7	8	0	7	4	1	3	13	6	2	
25-Aug		3	16	10	0	1	5	0	1	10	7	2	
26-Aug		5	28	3	0	4	0	1	0	9	12	1	
27-Aug		9	1	1	0	1	0	0	0	2	4	2	
28-Aug		0	1	9	0	6	2	0	0	4	4	7	
29-Aug		7	1	15	2	6	1	0	0	3	5	3	
30-Aug		5	6	16	1	2	9	3	1	1	11	1	
31-Aug		0	4	1	2	3	2	0	0	0	18	2	
1-Sep		0	7	1	2	1	1	0	1	10	13	3	
2-Sep		2	4	0	0	1	0	0	1	2	35	2	
3-Sep		1	7	20	4	8	0	0	0	6	6	1	
4-Sep		0	1	13	5	2	0	0	0	8	11	0	
5-Sep		1	3	5	0	4	0	0	2	5	34	2	
6-Sep		1	0	2	2	2	0	0	0	4	47	0	
7-Sep		1	1	3	3	3	0	0	0	8	30	1	
8-Sep		1	0	3	0	0	0	0	0	12	24	0	
9-Sep		0	1	5	2	0	0	0	1	7	22	2	
10-Sep		1	0	4	2	0	1	0	0	5	13	3	
11-Sep		0	0	12	1	3	0	0	1	6	6	6	
12-Sep		1	0	6	2		0	0	2	4	4		
13-Sep			3	6	0		0	2	0	7	1		
14-Sep			0				1	0	0	3	3		
15-Sep			0				1	1		4	3		
16-Sep			1				0				3		
17-Sep							0				2		
18-Sep							0				3		
19-Sep							0				0		
20-Sep							0						
21-Sep							0						
22-Sep							0						
23-Sep							0						
Total	316,530	1,972	214,837	429	227,208	769	43,491	820	165,991	4,303	399,670	39,030	220,735

= estimated escapement count
= partial day's count adjusted to 24 hours

Appendix 6. Historical daily sockeye salmon estimates recorded at the East Fork Andreafsky River weir, 1994-2006. Data for 2001 were not used in calculations and are shown for informational purposes only.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
15-Jun				0									
16-Jun		0		0									
17-Jun		0		0		0							
18-Jun		0		0		0				0			
19-Jun		0	0	0		0			0	0			
20-Jun		0	0	0		0			0	0			
21-Jun		0	0	0		0			0	0			
22-Jun		0	0	0		0			0	0			
23-Jun		0	0	0	0	0			0	0	0		
24-Jun		0	0	0	0	0			0	0	0		
25-Jun		0	0	0	0	0			0	0	0		
26-Jun		0	0	0	0	0			0	0	0	0	
27-Jun		0	0	0	0	0			0	0	1	0	
28-Jun		0	0	0	0	0			0	0	2	0	0
29-Jun	0	0	0	1	3	1			0	1	5	0	0
30-Jun	0	0	0	0	0	0	0		0	0	2	1	0
1-Jul	0	2	0	1	0	0	0		0	0	0	1	0
2-Jul	0	0	6	0	0	0	0		0	0	3	0	0
3-Jul	0	1	9	0	0	0	0		0	0	5	0	9
4-Jul	0	0	16	0	0	1	0		0	1	3	0	50
5-Jul	0	1	6	0	0	8	0		0	4	9	0	15
6-Jul	0	4	1	0	0	1	0		1	4	7	0	27
7-Jul	2	0	7	1	0	2	0		0	4	22	0	16
8-Jul	1	0	0	0	3	6	0		0	2	18	0	12
9-Jul	0	0	10	0	0	2	0		0	2	14	0	13
10-Jul	0	1	6	1	0	0	0		0	13	15	0	12
11-Jul	1	1	6	0	4	7	1		0	14	18	0	16
12-Jul	0	0	8	0	8	0	0		1	4	16	1	20
13-Jul	0	0	7	0	3	0	0		0	4	19	0	4
14-Jul	0	0	9	2	0	0	1		0	1	10	15	3
15-Jul	1	0	4	1	10	0	0	0	0	8	3	0	7
16-Jul	2	0	5	2	7	1	0	0	3	13	6	1	5
17-Jul	0	0	4	1	5	5	0	0	1	23	9	0	18
18-Jul	2	3	8	1	13	2	0	1	2	0	7	0	21
19-Jul	0	0	7	0	17	0	0	0	3	9	12	0	26
20-Jul	3	1	6	1	3	2	0	0	1	3	12	0	21
21-Jul	2	2	3	0	1	0	0	0	1	1	7	2	32
22-Jul	0	0	4	2	6	0	0	4	1	8	2	0	12
23-Jul	0	0	4	1	3	0	0	1	2	11	7	0	31
24-Jul	1	0	1	0	1	0	0	2	4	11	10	5	19
25-Jul	1	8	1	0	9	1	0	1	0	2	16	5	15
26-Jul	1	2	3	0	0	0	0	0	0	15	9	2	13
27-Jul	5	1	3	0	0	0	0	2	1	25	16	5	9
28-Jul	4	0	2	3	6	0	0	0	2	19	6	4	
29-Jul	3	1	0	3	5	0	0	0	0	9	5	7	
30-Jul	2	3	0	2	5	1	1	0	0	18	6	1	
31-Jul	0	0	5	0	4	1	1	0	4	7	7	1	
1-Aug	2	4	1	3	5	0	0	0	3	16	8	0	
2-Aug		0	1	2	1	0	0	0	3	4	9	0	
3-Aug		3	1	1	6	0	1	1	0	11	3	0	
4-Aug		0	4	0	4	1	1	0	0	40	7	0	

Appendix 6. Continued.

Date	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
5-Aug		0	1	0	3	0	1	0	0	5	2	2	
6-Aug		0	4	0	2	2	0	0	1	11	8	4	
7-Aug		1	3	0	5	0	0	0	0	9	9	0	
8-Aug		1	1	0	2	0	2	0	0	4	8	8	
9-Aug		0	5	0	2	0	1	0	1	2	6	1	
10-Aug		0	3	0	1	0	0	0	1	6	3	1	
11-Aug		0	2	0	4	1	1	0	0	6	5	2	
12-Aug		0	0	0	2	1	0	0	2	3	5	1	
13-Aug		3	0	2	12	1	0	1	0	12	4	3	
14-Aug		3	1	0	2	0	0	0	0	8	3	3	
15-Aug		3	1	0	1	0	0	0	0	7	2	0	
16-Aug		5	5	0	3	0	0	0	0	6	1	4	
17-Aug		5	0	0	2	0	1	0	0	5	0	0	
18-Aug		1	1	1	1	0	1	0	0	8	6	13	
19-Aug		1	5	2	0	2	1	0	0	8	4	0	
20-Aug		3	1	5	0	3	0	1	0	17	5	0	
21-Aug		1	3	5	0	2	0	0	0	0	6	1	
22-Aug		13	1	1	0	0	0	0	0	6	3	0	
23-Aug		9	0	1	0	1	0	0	0	11	0	0	
24-Aug		4	3	1	0	0	2	0	1	10	5	7	
25-Aug		0	16	8	0	0	3	0	0	5	15	1	
26-Aug		1	6	2	0	2	0	0	1	1	4	2	
27-Aug		0	2	1	0	0	11	0	0	6	2	0	
28-Aug		4	2	2	0	2	3	0	0	6	2	15	
29-Aug		1	4	5	0	0	4	0	1	4	2	5	
30-Aug		1	5	6	3	2	3	1	0	2	4	5	
31-Aug		2	0	0	0	0	5	0	0	2	1	1	
1-Sep		3	2	0	1	4	13	0	0	2	6	2	
2-Sep		0	1	4	1	2	5	0	0	1	6	2	
3-Sep		0	3	2	0	9	2	0	0	1	2	8	
4-Sep		2	3	1	0	13	2	0	0	5	5	1	
5-Sep		0	3	1	0	15	0	0	0	4	15	3	
6-Sep		3	2	2	0	2	0	0	0	0	6	3	
7-Sep		1	1	3	0	0	0	0	1	0	1	0	
8-Sep		2	0	1	1	1	0	0	0	1	2	0	
9-Sep		0	0	4	6	2	1	0	1	0	4	0	
10-Sep		1	0	4	0	0	2	0	0	0	1	2	
11-Sep		1	0	2	2	4	0	0	0	1	1	0	
12-Sep		0	0	3	0		0	0	0	0	1		
13-Sep			0	2	0		2	0	0	1	0		
14-Sep			0				1	0	0	1	0		
15-Sep			0				0			0	0		
16-Sep			0				0				1		
17-Sep							1				3		
18-Sep							0				2		
19-Sep							0				1		
20-Sep							1						
21-Sep							3						
22-Sep							1						
23-Sep							0						
Total	**	113	248	100	188	113	79	**	43	494	508	151	426

= estimated escapement counts

** = incomplete count, missing data not estimated.